Space Weather Forecast

Issued on Tuesday, 09 August 2022 at 12:08 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Reducing chance of further Minor Geomagnetic Storms through midweek.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been very low over the past 24 hours, with X-ray activity below even common class. There are now up to six sunspot regions on the Sun, with a new region just becoming visible on the southeastern horizon. All of these sunspots appear either magnetically unipolar, or else simple dipoles. The most dynamic of these sunspots was a small bipolar group in the southeast, with growth and proliferation of spots observed, however this did not culminate in any flares.

No Coronal Mass Ejections (CMEs) were visible in available imagery. A 'filament' (arc of plasma) seen leaving the northern centre of the Sun immediately prior to this 24-hour period was modelled and determined to most likely pass above the plane of the Earth's orbit to no effect at Earth.

Solar Wind / Geomagnetic Activity: Earth is currently under the influence of the fast wind from a coronal hole.

The solar wind speed was elevated through the period, with a very slight decline evident. The number of particles in the solar wind also showed a slight decline, and their associated magnetic field was diminished in magnitude relative to the previous UTC day's values, remaining within long-term background. The north-south component of the solar wind's magnetic field remained rather volatile, alternating between aligned and anti-aligned spells with Earth's field to lesser and greater geomagnetic effect (respectively).

The net result of the above solar wind measures was nevertheless below Minor Geomagnetic Storm G1 throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low or very low solar activity is expected. The outlook is for greater chances of flares, but this depends on arrivals over the eastern horizon and any front-sided development, and should be considered against the current very low baseline of activity.

Solar Wind / Geomagnetic Activity: No CMEs feature in the current forecast.

Solar winds are forecast to be elevated due to a succession of coronal hole high speed streams. Transition between all of these features may be indistinct however.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

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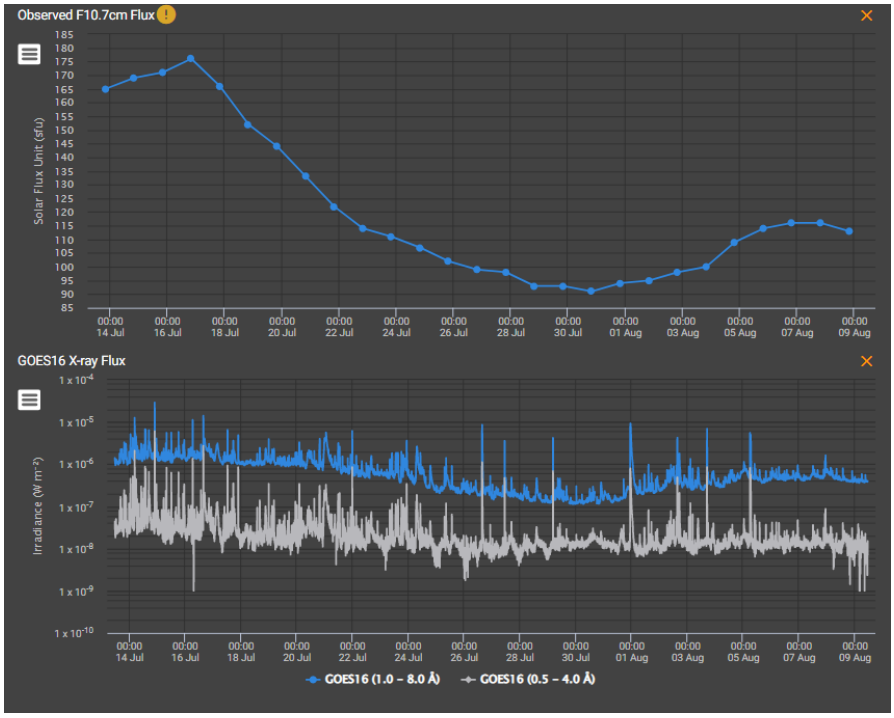
There remains a decreasing chance of Minor Geomagnetic Storm G1 on days one and two (through to Wednesday 10 August) as a result of the train of successive coronal hole fast winds, with the second half of the UTC week then likely to see increasingly quiet geomagnetic conditions.

Energetic Particles / Solar Radiation: No solar radiation storms are expected given the current relatively few and magnetically simple cohort of sunspots.

Figure 1: Past rotation of the Sun (27 days) in 10cm flux emanating from the Sun and detected by an observatory in Canada (linked to the number of sunspots), showing a relative lull in activity in the past fortnight. Also shown is the X-ray flares over the period, with a similar definite lull in the past fortnight.



Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	25	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

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Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	1	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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